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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,695	01/13/2004	Jon M. Long	9818-0103-999	4099
24341	7590	11/30/2004	EXAMINER	
MORGAN, LEWIS & BOCKIUS, LLP. 2 PALO ALTO SQUARE 3000 EL CAMINO REAL PALO ALTO, CA 94306			MAGEE, THOMAS J	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/757,695

Applicant(s)

LONG, JON M.

Examiner

Thomas J. Magee

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received:
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Rejections – 35 U.S.C. 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 5, 8 – 11, 14, 17, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Corisis (US 6,326,687 B1).

3. Regarding Claim 1, Corisis discloses an electrical device package comprising:

a die (24) (Figure 2),

a plurality of lead fingers (36) (Figure 1), some of the lead fingers being electrically connected to the die (32,28) (Figure 2),

a conductive sheet (20) having an inner region and an outer region and at least one opening (70) in the sheet (Figure 1). Corisis does disclose (Figure 2) that the conductive sheet (20) is continuous across the package and that the inner and outer regions are part of one structure and "electrically" connected, the conductive sheet (outer region) being electrically connected to at least one of the lead fingers (Col. 6, lines 23 – 26) and electrically insulated from other lead fingers (Figure 1),

an encapsulant (84,12) containing the die and the conductive sheet, a portion of the encapsulant on one side of the conductive sheet being physically connected to another portion of the encapsulant on the other side of the conductive sheet through the at least one opening in the conductive sheet.

Corisis does not explicitly disclose that the die and the inner region of the conductive sheet are electrically connected. As discussed above, the inner and outer portions are part of one sheet and electrically connected. Further, Corisis discloses that the conductive sheet is connected to a ground bus (lead) (Col. 6, lines 24 – 27) and that lead fingers are connected to the die by wires (Col. 4, lines 39 – 43) onto the bond pads. It is therefore implicit that the die and the inner region of the conductive sheet are electrically connected through the bond wire and the ground bus lead.

4. Regarding Claims 5 and 17, Corisis discloses an electrical device package, wherein the at least one of the plurality of lead fingers (36) is electrically connected to ground (Col. 6, lines 23 – 26).

5. Regarding Claim, 8, Corisis discloses an electrical device package, wherein the at least one opening comprises a plurality of through holes (70) (Figure 1) in the conductive sheet.

6. Regarding Claims 9 and 20, Corisis discloses an electrical device package, wherein the plurality of through holes (70) are regularly spaced on the conductive sheet (20) and the dimension of each hole is large enough for the encapsulant to move through the hole (Figure 1).

Art Unit: 2811

7. Regarding Claim 10, Corisis discloses an electrical device package, wherein the diameter of the through hole is macroscopic and a fractional part of the package dimension (Figure 1), and therefore, the diameter is at least 4 mils.

8. Regarding Claim 11, Corisis discloses an electrical device package, wherein the conductive sheet is made of copper (Col. 5, lines 58 – 61).

9. Regarding Claim 14, Corisis discloses a method of reducing crosstalk in a lead frame based electrical device package, comprising:

providing a die attach pad (paddle) (26) (Figure 2)

attaching a die (24) (Figure 2) to the die attach pad (26), the die having a plurality of bond pads (28) (Col. 4, lines 39 – 43) on its surface,

deploying a plurality of lead fingers (36) (Figure 1) near the die and electrically connecting lead fingers to bond pads (Col. 4, lines 39 – 43),

positioning a conductive sheet (22) below the die attach pad (26) and the plurality of lead fingers (36), the conductive sheet having an inner region and an outer region and at least one opening (70),

encapsulating (84,12) the die, die attach pad with an encapsulant, the encapsulant having a first portion and a second portion that are physically connected together through the at least one opening in the conductive sheet and the conductive sheet, and the encapsulant electrically insulating the conductive sheet (22) from the lead fingers (36) (Figure 1) that are not electrically connected to the conductive sheet.

Art Unit: 2811

Corisis does not explicitly disclose that the die and the inner region of the conductive sheet are electrically connected. Corisis does disclose that the conductive sheet (20,22) is connected to a ground bus (lead) (Col. 6, lines 24 – 27) and that lead fingers are connected to the die by wires (Col. 4, lines 39 – 43) onto the bond pads. It is therefore implicit that the die and the conductive sheet are electrically connected through the bond wire and the ground bus lead.

10. Regarding Claim 21, Corisis discloses an electrical device package comprising:

- a plurality of lead fingers (36) (Figure 1),

- a die (24) having a first surface and a second surface and a plurality of bond pads (28) on the first surface, said die being connected to the lead fingers by first bondwires (32) between at least some of the bond pads and some of the lead fingers (Col. 4, lines 39 – 43),

- a conductive sheet (20,22) extending between the die (24) and the plurality of lead fingers (36), the conductive sheet being electrically insulated from the first bondwires and leadwires to which they are connected (Figure 2), and

- an electrical connection between at least one lead finger (bus) and an outer region of the conductive sheet (Col. 6, lines 23 – 26).

Corisis does not explicitly disclose that the at least one bond pad and the inner region of the conductive sheet are electrically connected. Corisis does disclose that the conductive sheet (20,22) is connected to a ground bus (lead) (Col. 6, lines 24 – 27) and that lead fingers are connected to the die by wires (Col. 4, lines 39 – 43) onto the bond pads. It is therefore implicit that the bond pad and the conductive sheet are electrically connected through the bond wire and the ground bus lead.

***Claim Rejections – 35 U.S.C. 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 2 – 4, 6, 7, 13, 15, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corisis, as applied to Claims 1, 5, 8 – 11, 14, 17, 20, and 21.

13. Regarding Claim 2, Corisis discloses that the plurality of lead fingers are substantially parallel to each other (Figure 1), but do not disclose that the distance between fingers is 80 – 100 microns. However, the spacing between leads is known in the art to be important in reducing shorts and coupling. It would have been obvious to one of ordinary skill in the art at the time of the invention to conduct a series of tests to optimize the spacing for a workable device.

14. Regarding Claims 3, 4, 15, and 16, Corisis does not disclose that the inner portion of the conductive sheet is electrically connected to a die attach pad or that the die attach pad is electrically connected to the first surface of the die. Corisis do disclose that the conductive sheet (20,22) is connected to a ground bus (lead) (Col. 6, lines 24 – 27) and that the lead fingers are connected to the die by wires (Col. 4, lines 39 – 43). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a bond wire from the die surface at the ground tab (bond pad) to the die attach pad to complete grounding of the device, thereby ensuring minimal interference coupling into the device and electrically connecting the conduc-

tive sheet and the die attach pad.

15. Regarding Claims 6 and 18, Corisis does not disclose an electrical device package wherein at least one of the plurality of lead fingers is electrically connected to a power supply. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to include an input from a power supply so that the electrical device would be operable.

16. Regarding Claims 7 and 19, Corisis discloses the presence of openings but does not disclose the area of the openings in the conductive sheet. It would have been obvious to one of ordinary skill in the art to conduct a series of tests to provide optimization of the opening areas in the conductive sheet.

17. Regarding Claim 13, Corisis discloses an electrical device package comprising:

- a die attach pad (26) (Figure 2),

- a die (24) having a first surface and a second surface and a plurality of bond pads (28) on the first surface, the second surface being adhered to the die attach pad (26),

- a plurality of lead fingers (36) (Figure 1) electrically connected to bond pads (28) (Figure 2) on the first surface through bondwires (32), and

- an encapsulant (12,84) (Figure 9) that encapsulates the die (24), the die attach pad (26), and the conductive sheet (20,22), a first part of the encapsulant, a first part of the encapsulant being physically connected to a second part of the encapsulant through the plurality of through holes (70) in the conductive sheet.



Corisis does not disclose that the inner region of the conductive sheet is electrically connected to the die attach pad and the outer region to the at least one of the plurality of lead fingers and that the at least one of a plurality of bond pads is electrically connected to the die attach pad.

Corisis does disclose that the conductive sheet (20,22) is connected to a ground bus (lead) (Col. 6, lines 24 – 27) and that the lead fingers are connected to the die by wires (Col. 4, lines 39 – 43). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a bond wire from the die surface at the ground tab (bond pad) to the die attach pad to complete grounding of the device, thereby ensuring minimal interference coupling into the device and electrically connecting the conductive sheet and the die attach pad.

18. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corisis, as applied to Claims 1, 5, 8 – 11, 14, 17, 20, and 21, and further in view of Solbrekken et al. (US 6,523,608 B1).

19. Regarding Claim 12, Corisis discloses that the conductive sheet is composed of copper but does not disclose that the sheet is a mesh made of copper. Solbrekken et al. disclose (Figure 1 the presence of a grid frame (mesh) made of copper (Col. 3, lines 11 – 14) that forms part of a conductive grid (108) mounted beneath a die (112). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Solbrekken et al. with Corisis to obtain an efficient conducting sheet for inductance screening and thermal dissipation.

### ***Conclusions***

20. Any inquiry concerning this communication or earlier communications from the

Art Unit: 2811

Examiner should be directed to **Thomas Magee**, whose telephone number is **(571) 272 1658**. The Examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM (EST). If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, **Eddie Lee**, can be reached on **(571) 272-1732**. The fax number for the organization where this application or proceeding is assigned is **(703) 872-9306**.

Thomas Magee  
November 12, 2004

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name and title.

**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

Art Unit: 2811